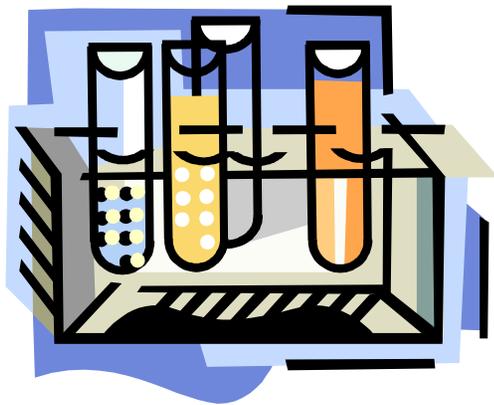


BIOSCIENCE



Maryland Department of Labor, Licensing and Regulation
Division of Workforce Development
Office of Workforce Information and Performance
1100 N. Eutaw Street, Room 316
Baltimore, MD 21201

January 2005

Bioscience Cluster

What is included in the Bioscience Cluster?

The Bioscience Cluster consists of industries that typically use specialized scientific knowledge and engineering principles to produce goods and to provide services, for organizations and consumers, related to the physical and life sciences. This report groups industries included in the Bioscience Cluster into two divisions:

Manufacturing establishments, which are engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. Included are the industries of:

NAICS

- **3254** Pharmaceutical and medicine manufacturing – produce biological, medicinal, and related pharmaceutical products.
- **334516** Analytical laboratory instrument manufacturing – produce instruments and systems used in the laboratory analysis of the chemical or physical composition/concentration of varied materials.
- **334517** Irradiation apparatus manufacturing – produce irradiation apparatus used for medical diagnostic/ therapeutic applications or for industrial, research and scientific evaluation.
- **339113** Surgical appliance and supplies manufacturing – produce surgical appliances and supplies, including orthopedic and prosthetic devices and personal industrial safety items.

Professional, Scientific and Technical Services establishments, which perform specialized professional, scientific, and technical services, requiring a high degree of expertise. Included in the Bioscience Cluster are:

NAICS

- **54138** Testing laboratories – perform physical, chemical or other analytical testing services.
- **54162** Environmental consulting services – provide advice or assistance to businesses and other organizations related to control or remediation of environmental pollutants and hazardous materials.
- **54171** Research and Development in physical, engineering and life sciences – conduct research and experimental development in physical, engineering and life sciences.

For additional descriptive information on NAICS, go to www.census.gov/epcd/naics02/

This publication was developed using data from the Quarterly Census of Employment and Wages (ES 202) and from the Occupational Employment Statistics (OES) Programs.

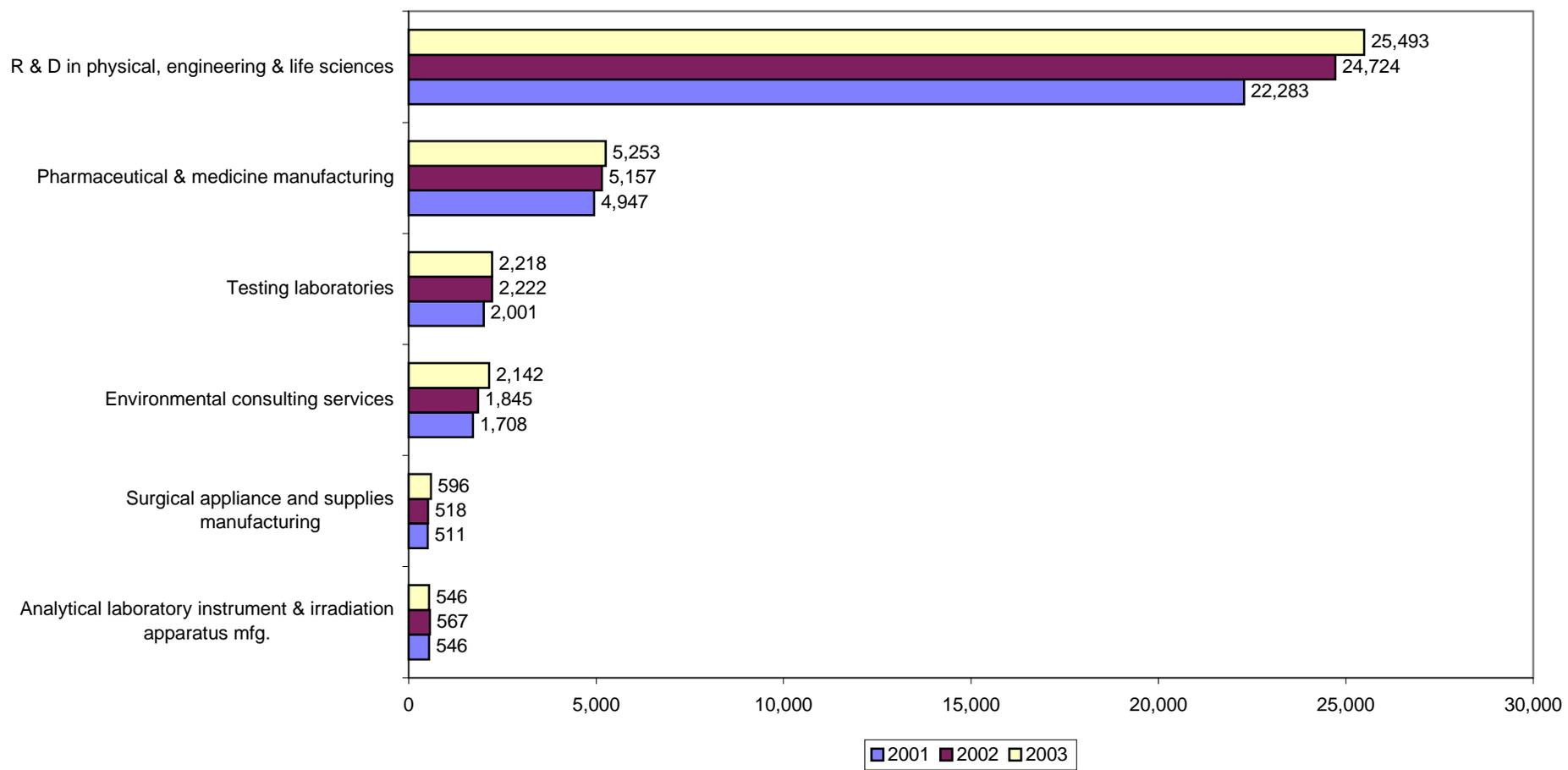
**Maryland
Employment and Wages in the Bioscience Cluster Industries**

NAICS	Industry Description	Employment			Payroll			Average Weekly Wage
		2001	2002	2003	2001	2002	2003	2003
	Bioscience	33,080	35,669	36,964	\$2,188,718,204	\$2,280,394,146	\$2,455,501,963	\$1,277
	Manufacturing	6,004	6,242	6,395	402,007,208	358,533,896	399,950,951	1,203
3254	Pharmaceutical and medicine manufacturing	4,947	5,157	5,253	349,115,734	302,640,180	334,361,570	1,224
334516 & 334517	Analytical laboratory instrument & irradiation apparatus mfg.	546	567	546	28,415,595	30,157,415	29,882,863	1,053
339113	Surgical appliance & supplies manufacturing	511	518	596	24,475,879	25,736,301	35,706,518	1,152
	Professional, Scientific and Technical Services	25,992	28,791	29,853	1,708,270,439	1,872,919,058	1,991,618,065	1,283
54138	Testing laboratories	2,001	2,222	2,218	86,502,495	101,045,079	104,694,635	908
54162	Environmental consulting services	1,708	1,845	2,142	92,902,879	97,711,559	108,432,350	974
54171	R & D in physical, engineering & life sciences	22,283	24,724	25,493	1,528,865,065	1,674,162,420	1,778,491,080	1,342
N/A	Nondistributable*	1,084	636	716	78,440,557	48,941,192	63,932,947	1,717

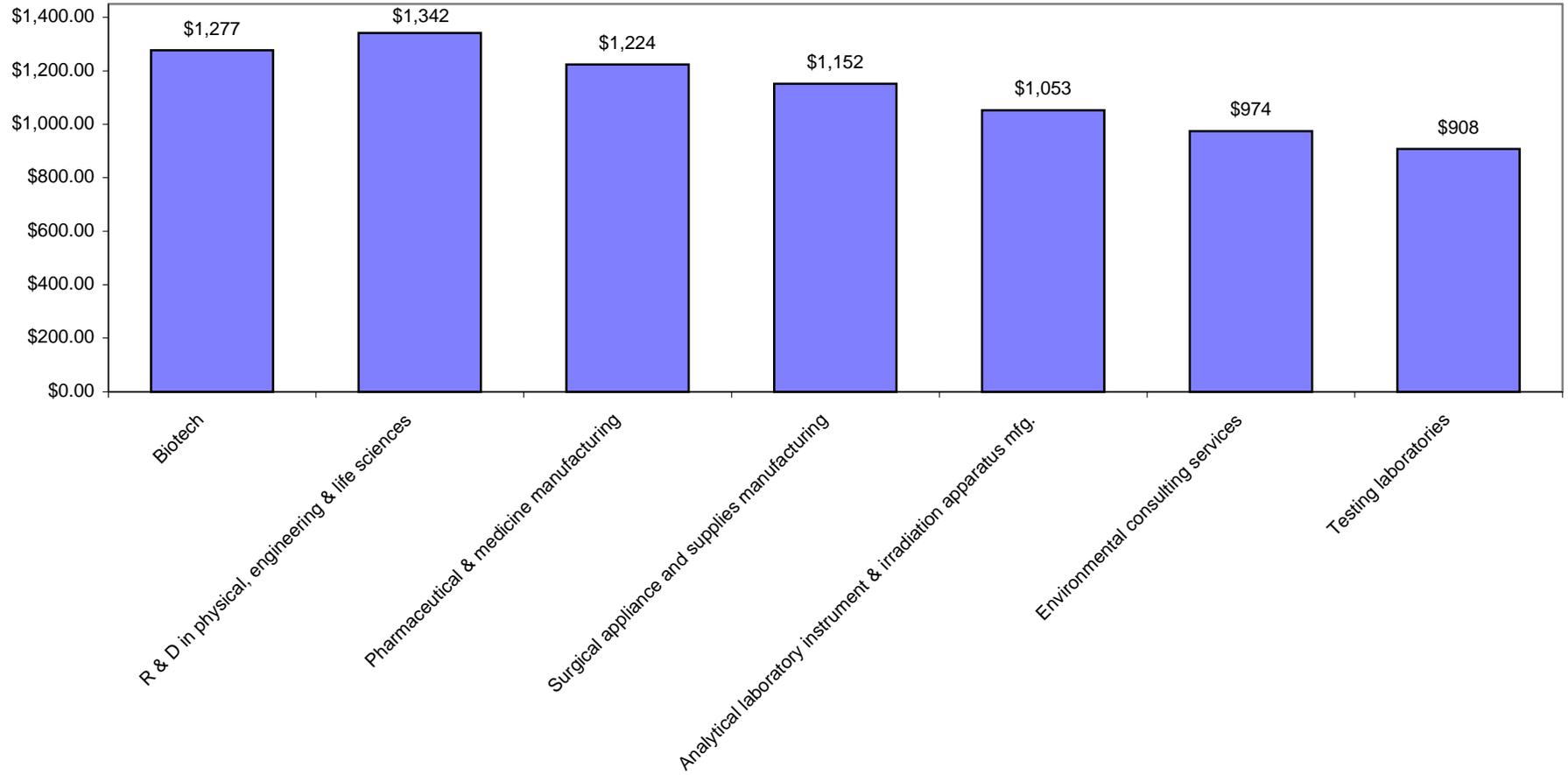
- The bioscience cluster, while comprising a relatively small share of Maryland's employment base, accounted for just over a third of the growth in the the statewide economy over the 2001-2003 period.
- Nearly 3,900 jobs were created within the cluster through 2003, with job gains spread across nearly every bioscience industry. Gains in bioscience businesses providing professional, scientific and technical services, a component accounting for about 8 out of every 10 jobs in the cluster, were the largest. Expansion in this grouping was propelled by job gains reported by businesses engaged in R & D activities -- the largest and the highest paying industry in the entire bioscience cluster.
- About 7 out of every 10 jobs in Maryland's bioscience cluster can be found in four individual/combined county Workforce Areas -- Montgomery County, Mid Maryland Area, Susquehanna Region and Baltimore County.

* Includes establishments in all Bioscience cluster NAICS industries that cannot be distributed geographically.

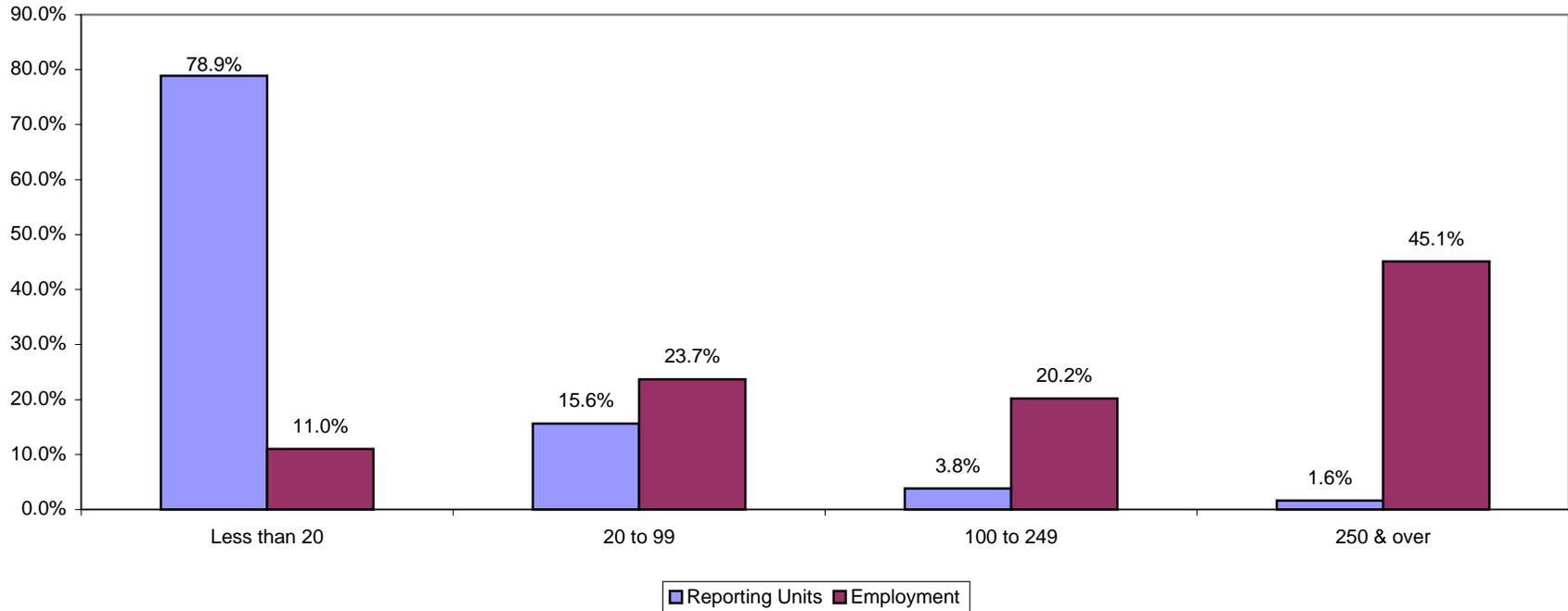
**Maryland
Employment in the Bioscience Cluster Industries - 2001-2003**



Maryland
Average Weekly Wage in Bioscience Cluster Industries - 2003



Maryland
Reporting Units and Employment Concentration in the Bioscience Cluster by Size Class*
Based on 4th Quarter 2003 Average Employment



	Reporting Units				Employment			
	Less than 20	20 to 99	100 to 249	250 & over	Less than 20	20 to 99	100 to 249	250 & over
Bioscience Cluster	990	196	48	20	3,987	8,605	7,330	16,362
Percent of Total	78.9%	15.6%	3.8%	1.6%	11.0%	23.7%	20.2%	45.1%

- About 8 out of every 10 business establishments in the bioscience cluster are manned by less than twenty workers. Among the detailed industries in the bioscience cluster, the highest density of small businesses are found in environmental consulting services where about 9 out of every 10 firms fall within this size class.
- While business concentration is centered in the less than 20 size class, worker concentration is greatest in the 250 & over size class. Large worker concentrations (with 250 + workers) are most prevalent in pharmaceutical and medicine manufacturing and R & D industries.

* Includes establishments in all Bioscience cluster NAICS industries that cannot be distributed geographically.

Maryland
Occupations Typically Associated with the Bioscience Cluster

Occupation	Annual Openings			Training Code	Median Hrly/Annual* Wage
	Growth*	Replacements *	Total *		
Statisticians	15	60	75	3	\$35.75
General and Operations Managers	1,420	1,230	2,650	4	35.50
Natural Sciences Managers	25	35	60	4	47.25
Sales Managers	280	155	435	4	36.50
Engineering Managers	90	95	185	4	46.25
Chemists	25	90	115	5	35.75
Environmental Engineers	20	10	30	5	34.25
Electrical Engineers	45	70	115	5	33.00
Computer Programmers	180	305	485	5	31.00
Chemical Engineers	5	20	25	5	37.00
Mechanical Engineers	50	125	175	5	34.50
Civil Engineers	115	70	185	5	28.75
Electrical & Electronic Engineering Technicians	90	90	180	6	22.50
Chemical Technicians	5	15	20	6	19.25
Civil Engineering Technicians	25	25	50	6	19.75
Supervisors/Managers of Production & Operating Wkrs.	95	170	265	8	22.25
Customer Service Representatives	735	485	1,220	10	14.00
Executive Secretaries and Administrative Assistants	400	580	980	10	18.25
Inspectors, Testers, Sorters, Samplers and Weighers	50	120	170	10	14.25
Team Assemblers	50	275	325	10	11.75
Sales Reps., Wholesale Scientific Products	150	145	295	10	34.25
Maintenance and Repair Workers, General	370	390	760	10	15.00
Stock Clerk/Order Filler	0	1,230	1,230	11	10.00
Office Clerks, General	695	1,165	1,860	11	12.50
Electrical/Electronic Equip. Assemblers	0	70	70	11	11.50
Packaging/Filling Machine Operators	45	80	125	11	10.75

Note: Occupations are ranked by training code

Estimates for Annual Openings rounded to the nearest 5

Wages adjusted to reflect inflationary pressures through September 2004.

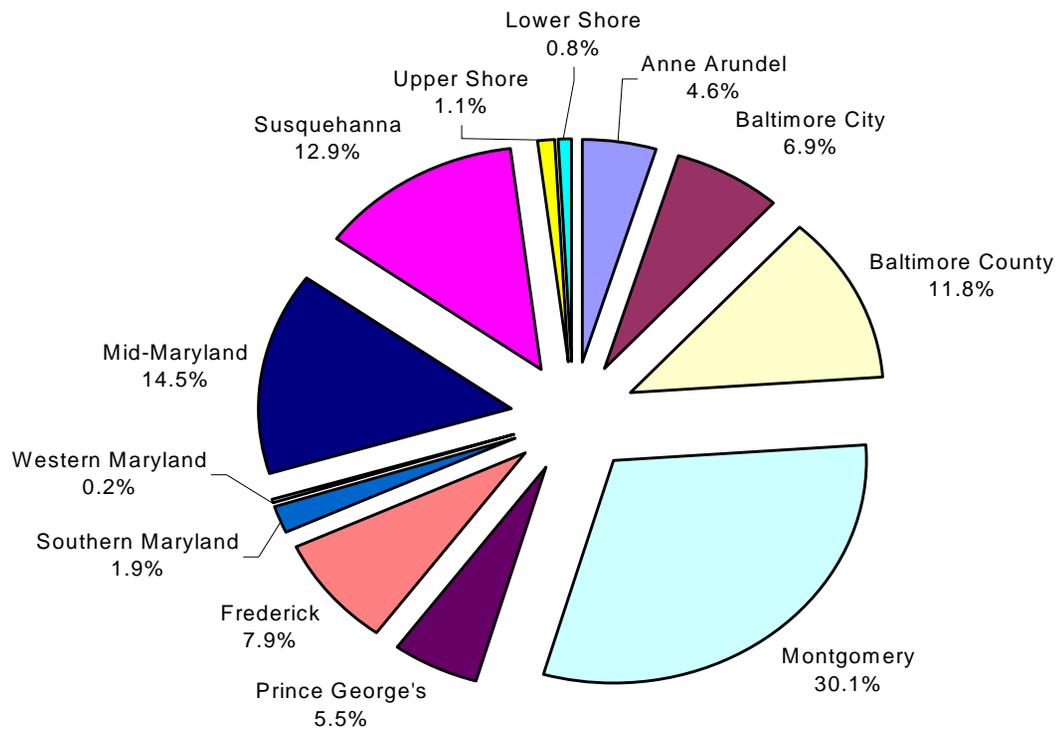
* Represents economy-wide demand 2002 - 2012

Education and Training Categories

Occupations are classified into 1 of 11 categories by the Bureau of Labor Statistics based on analyses of the occupation's usual education and training requirements conducted while developing information to present in the *Occupational Outlook Handbook*. The 11 classifications are as follows:

- 1 **First professional degree.** Completion of the academic program usually requires at least 6 years of full-time equivalent academic study, including college study prior to entering the professional degree program.
- 2 **Doctoral degree.** Completion of the degree program usually requires at least 3 years of full-time equivalent academic work beyond the bachelor's degree.
- 3 **Master's degree.** Completion of the degree program usually requires 1 or 2 years of full-time equivalent study beyond the bachelor's degree.
- 4 **Work experience, plus a bachelor's or higher degree.** Most occupations in this category are managerial occupations that require experience in a related nonmanagerial position.
- 5 **Bachelor's degree.** Completion of the degree program generally requires at least 4 years but not more than 5 years of full-time equivalent academic work.
- 6 **Associate degree.** Completion of the degree program usually requires at least 2 years of full-time equivalent academic study.
- 7 **Postsecondary vocational training.** Some programs last only a few weeks while others may last more than a year. In some occupations, a license is needed that requires passing an examination after completion of the training.
- 8 **Work experience in a related occupation.** Some occupations requiring work experience are supervisory or managerial occupations.
- 9 **Long-term on-the-job training.** This category includes occupations that generally require more than 12 months of on-the-job training or combined work experience and formal classroom instruction for workers to develop the skills needed for average job performance. This category includes formal and informal apprenticeships that may last up to 4 years and short-term intensive employer-sponsored training that workers must successfully complete. Individuals undergoing training are generally considered to be employed in the occupation. This category includes occupations in which workers may gain experience in non-work activities, such as professional athletes who gain experience through participation in athletic programs in academic institutions.
- 10 **Moderate-term on-the-job training.** This category includes occupations in which workers can develop the skills needed for average job performance after 1 to 12 months of combined on-the-job experience and informal training.
- 11 **Short-term on-the-job training.** This category covers occupations in which workers can develop the skills needed for average job performance after a short demonstration or up to one month of on-the-job experience or instruction.

Bioscience Cluster - 2003



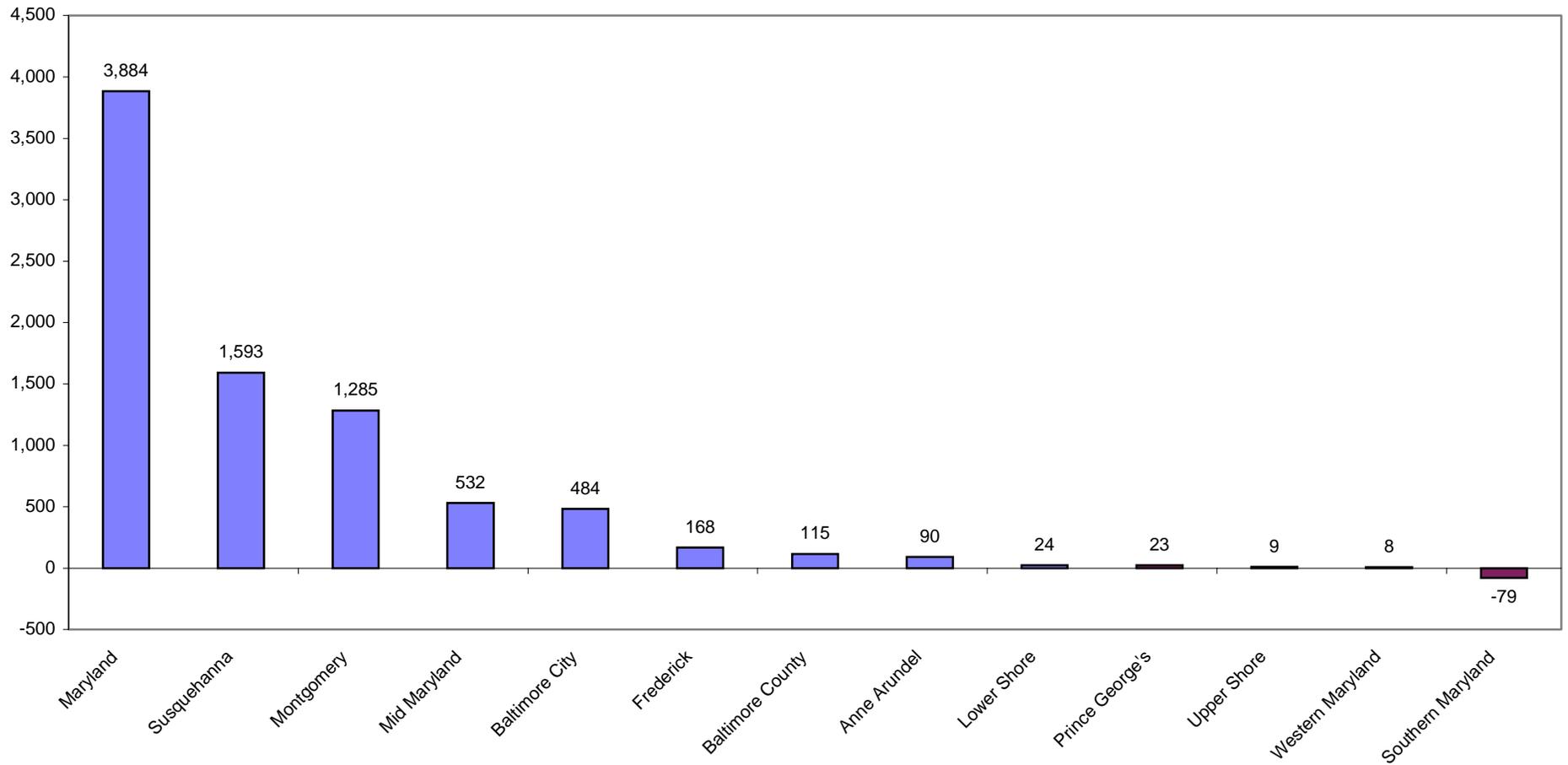
**Employment and Wages in the Bioscience Cluster
By WIA and Select Local Jurisdictions**

WIA	Employment			Employment Change 2001 - 2003	Number of Reporting Units 2003	Total Wages 2003	Average Weekly Wage 2003
	2001	2002	2003				
Anne Arundel	1,624	1,706	1,714	90	87	\$117,793,413	\$1,322
Baltimore City	2,058	2,208	2,542	484	77	125,892,277	952
Baltimore County	4,255	4,558	4,370	115	120	251,847,100	1,108
Frederick	2,740	2,770	2,908	168	61	149,526,417	989
Montgomery	9,848	10,865	11,133	1,285	392	825,675,652	1,426
Prince George's	1,993	1,926	2,016	23	84	135,032,626	1,288
Lower Shore	269	276	293	24	18	8,370,873	549
Somerset	D	D	D	D	D	D	D
Wicomico	199	203	222	23	13	5,768,780	500
Worcester	D	D	D	D	D	D	D
Mid Maryland	4,831	5,308	5,363	532	104	414,145,920	1,485
Carroll	39	43	48	9	14	1,920,939	770
Howard	4,792	5,265	5,315	523	90	412,224,981	1,492
Southern Maryland	769	793	690	-79	43	37,421,661	1,043
Calvert	12	26	33	21	6	1,513,069	882
Charles	166	213	146	-20	11	6,196,887	816
St Mary's	591	554	511	-80	26	29,711,705	1,118
Susquehanna	3,158	4,150	4,751	1,593	65	310,144,840	1,255
Cecil	D	D	D	D	D	D	D
Harford	D	D	D	D	D	D	D
Upper Shore	393	410	402	9	24	14,051,096	672
Caroline	D	D	D	D	D	D	D
Dorchester	D	D	D	D	D	D	D
Kent	D	D	D	D	D	D	D
Queen Anne's	27	27	28	1	6	1,024,515	704
Talbot	191	212	217	26	14	8,721,550	773
Western Maryland	58	63	66	8	10	1,667,141	486
Allegany	D	D	D	D	D	D	D
Garrett	D	D	D	D	D	D	D
Washington	D	D	D	D	D	D	D
Nondistributable*	1,084	636	716	-368	193	63,932,947	1,717
Maryland	33,080	35,669	36,964	3,884	1,278	2,455,501,963	1,277

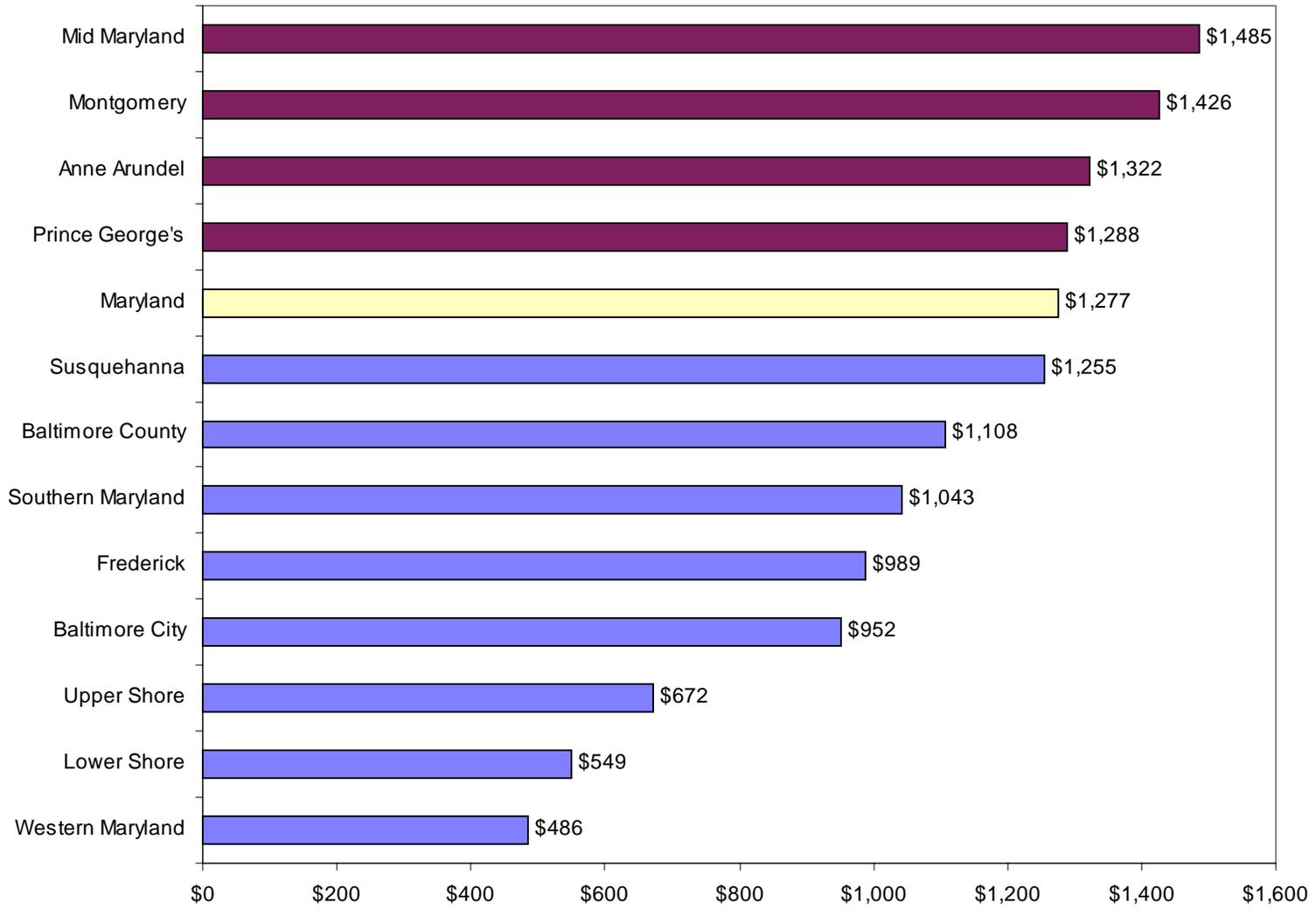
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* Includes establishments in all Bioscience cluster NAICS industries that cannot be distributed geographically

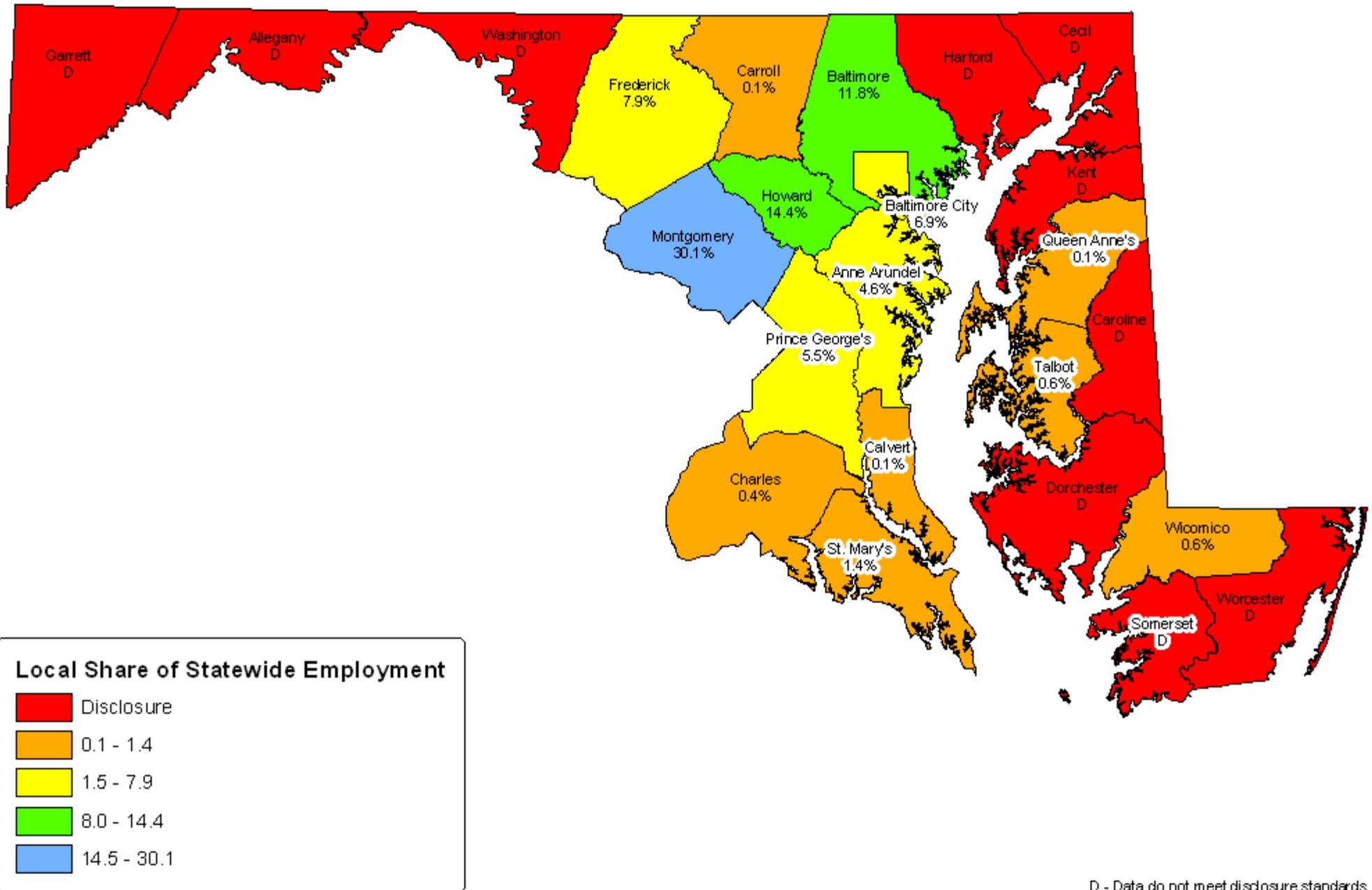
Employment Changes in the Bioscience Cluster by WIA 2001 - 2003



Average Weekly Wage in the Bioscience Cluster by WIA - 2003

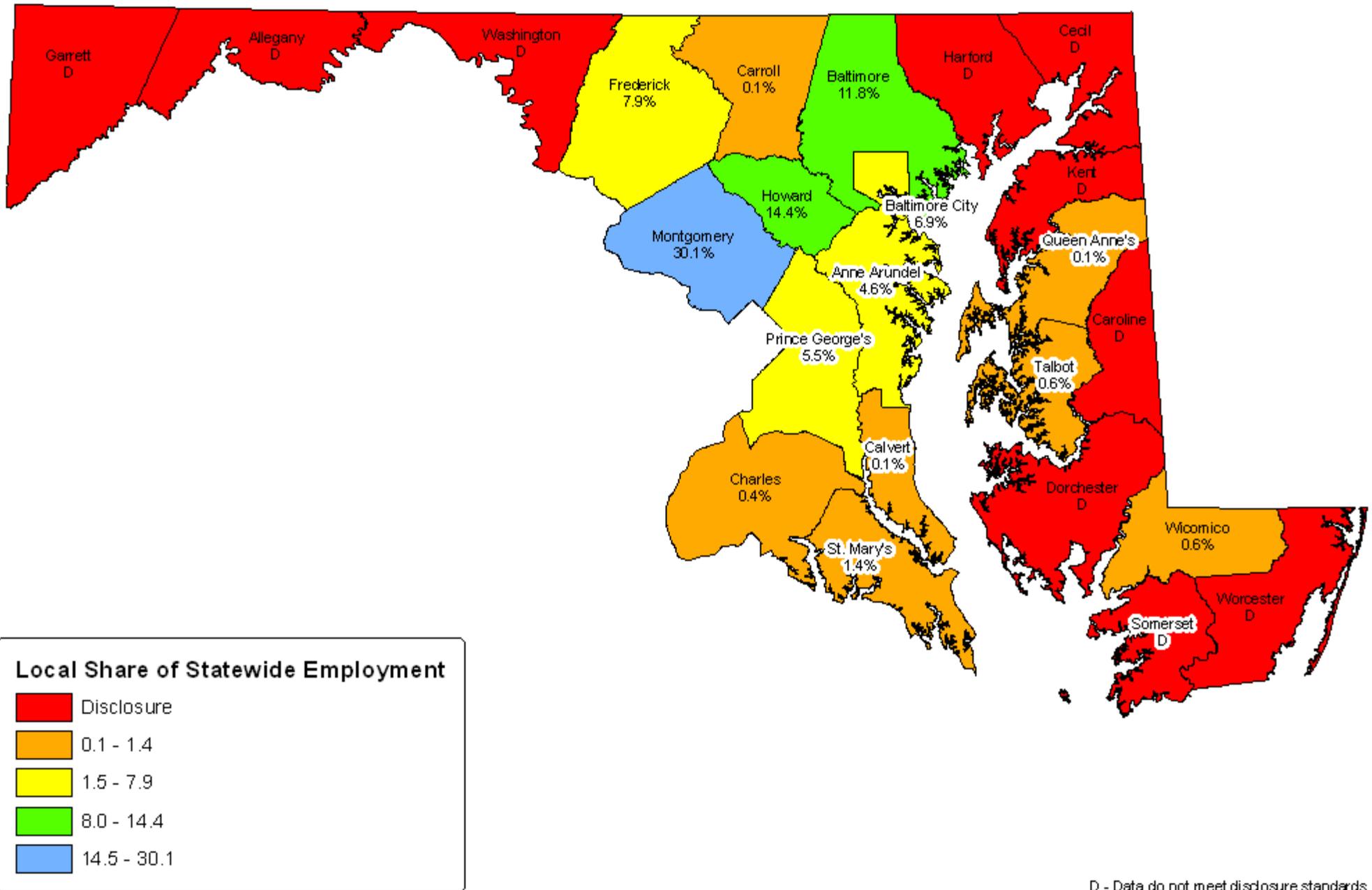


Local Share of Statewide Employment in the Bioscience Cluster 2003



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Local Share of Statewide Employment in the Bioscience Cluster 2003



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